Occupational Analyses Series

Concrete Finisher

2006

Trades and Apprenticeship Division

Human Resources
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The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this Occupational Analysis as the national standard for the occupation of Concrete Finisher.

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OTHER RELATED OCCUPATIONAL TITLES

This analysis covers tasks performed by concrete finishers whose occupational title has been identified by some provinces and territories of Canada under the following names:

- Cement Finisher
- Cement Mason

LIST OF RED SEAL NATIONAL OCCUPATIONAL ANALYSES

TITLE	NOC* Code
Appliance Service Technician (2005)	7332
Automotive Painter (2005)	7322
Automotive Service Technician (2005)	7321
Baker (1997)	6252
Boilermaker (2003)	7262
Bricklayer (2000)	7281
Cabinetmaker (2000)	7272
Carpenter (2005)	7271
Concrete Finisher (2006)	7282
Construction Electrician (2003)	7241
Cook (2003)	6242
Electrical Rewind Mechanic (1999)	7333
Electronics Technician – Consumer Products (1997)	2242
Farm Equipment Mechanic (2000)	7312
Floorcovering Installer (2005)	7295
Glazier (2004)	7292
Hairstylist (2005)	6271
Heavy Duty Equipment Technician (2004)	7312
Industrial Electrician (2003)	7242
Industrial Instrument Mechanic (2000)	2243
Industrial Mechanic (Millwright) (1999)	7311
Insulator (Heat and Frost) (2000)	7293
Ironworker (Generalist) (1993)	7264
Lather (Interior Systems Mechanic) (2002)	7284
Machinist (2005)	7231
Metal Fabricator (Fitter) (2003)	7263

Mobile Crane Operator (2006)	7371
Motorcycle Mechanic (1995)	7334
Motor Vehicle Body Repairer (Metal and Paint) (2005)	7322
Oil Burner Mechanic (1997)	7331
Painter and Decorator (2000)	7294
Partsperson (2005)	1472
Plumber (2003)	7251
Powerline Technician (2004)	7244
Recreation Vehicle Mechanic (2000)	7383
Refrigeration and Air Conditioning Mechanic (2004)	7313
Roofer (2006)	7291
Sheet Metal Worker (1997)	7261
Sprinkler System Installer (2003)	7252
Steamfitter – Pipefitter (1996)	7252
Tilesetter (2004)	7283
Tool and Die Maker (2005)	7232
Transport Trailer Technician (2003)	7321
Truck and Transport Mechanic (2000)	7321
Welder (2004)	7265

* National Occupational Classification

Requests for these publications should be forwarded to:

Trades and Apprenticeship Division
Human Resources Partnerships
Human Resources and Skills Development Canada
140 Promenade du Portage, Phase IV, 5th Floor
Gatineau, Quebec K1A 0J9

These publications are also available to order or download online at: **www.red-seal.ca**.

A comparative listing of apprenticeship training programs across Canada may be accessed at **www.ellischart.ca**. The Ellis Chart also lists the current provincial and territorial trade names.

FOREWORD

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources and Skills Development Canada (HRSDC) sponsors a program, under the guidance of the Canadian Council of Directors of Apprenticeship (CCDA), to develop a series of occupational analyses.

The Occupational Analysis Program has the following objectives:

- to identify and group the tasks performed by skilled workers in particular occupations;
- to identify those tasks that are performed by skilled workers in every province and territory;
- to develop instruments for use in the preparation of Interprovincial Standards "Red Seal" Examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility, in Canada, of apprentices and skilled workers;
- to supply employers and employees, and their associations, industries, training institutions and governments with analyses of the tasks performed in particular occupations.

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GUIDE TO ANALYSIS

DEVELOPMENT OF ANALYSIS

A draft analysis is developed by a committee of industry experts in the field led by a team of facilitators. This draft analysis identifies all the tasks performed in the occupation.

The draft is translated and reviewed by the NOA Team of HRSDC. A copy of this analysis is then forwarded to provincial/territorial authorities for review by specialists in the field. Their recommendations are assessed and incorporated into the final draft.

The occupational analysis is published in both official languages.

STRUCTURE OF ANALYSIS

To facilitate understanding of the nature of the occupation, the work performed is divided into the following divisions:

BLOCK – is the largest division within the analysis and reflects a distinct operation relevant to the occupation.

TASK – is the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform to complete a specific assignment within a "BLOCK".

SUB-TASK – is the smallest division into which it is practical to subdivide any work activity and, combined with others, fully describes all duties constituting a "TASK".

Supporting Knowledge & Abilities

The elements of skill and knowledge that an individual must acquire to adequately perform the sub-task.

Trends

Any shifts or changes in technology that affect the block.

Related Components

All components related to tasks performed in a specified block.

Tools and Equipment

All tools and equipment necessary for the concrete finisher to perform the work on all given tasks identified within the block.

Context

A statement written to clarify the intent and meaning of tasks in the analysis.

VALIDATION METHOD

At the request of the Canadian Council of Directors of Apprenticeship (CCDA), the Standardization Sub-committee developed a method for validating the Red Seal National Occupational Analyses.

A draft of the analysis is sent to all jurisdictions for validation. Each jurisdiction rates the sub-tasks and applies percentage ratings to blocks and tasks. This method for the validation of the National Occupational Analysis identifies common core tasks across Canada for a specific occupation. This feature facilitates the weighting of the Interprovincial Standards "Red Seal" Examinations.

DEFINITIONS

YES: the sub-task is performed by workers in the occupation in a specific jurisdiction.

NO: the sub-task is not performed by workers in the occupation in a specific jurisdiction.

BLOCK %: the average number of questions (items), derived from the collective decision made by workers within the occupation from all areas of Canada, that will be placed on an interprovincial examination to assess each block of the analysis.

TASK %: the average number of questions (items), derived from the collective decision made by workers within the occupation from all areas of Canada, that will be placed on an interprovincial examination to assess each task of the analysis.

NV: Not Validated by a province/territory.

ND: Not Designated in a province/territory.

PROVINCIAL/TERRITORIAL ABBREVIATIONS

NL:	Newfoundland and Labrador
NS:	Nova Scotia
PE:	Prince Edward Island
NB:	New Brunswick
QC:	Quebec
ON:	Ontario
MB:	Manitoba
SK:	Saskatchewan
AB:	Alberta
BC:	British Columbia
NT:	Northwest Territories
YT:	Yukon
NU:	Nunavut

COMMON CORE

The criteria for determining common core depend on the performance of sub-tasks. If at least 70% of the responding jurisdictions (excluding NVs and NDs) perform a sub-task, it shall be considered common core.

Interprovincial Standards "Red Seal" Examinations are based on the common core identified through this validation process. Validation identifies what will be assessed through the interprovincial examination.

BLOCK AND TASK WEIGHTING (APPENDIX D)

This appendix represents the block and task percentages as submitted by each jurisdiction.

Each jurisdiction, with the use of a provincial/territorial occupational advisory committee, validates the content, places percentages on blocks and tasks, and indicates whether or not the sub-tasks are performed by the skilled workers within the occupation. The results of this exercise are submitted to the NOA Team who then analyzes the data and develops this appendix which provides the individual jurisdictional validation results as well as the national averages of all responses.

PIE CHART (APPENDIX E)

The graph depicts the national percentages assigned to blocks in the analysis.

SCOPE OF THE CONCRETE FINISHER OCCUPATION

Concrete finishers place, finish and protect concrete surfaces. They work on a variety of vertical and horizontal surfaces and structures such as concrete floors, walls, sidewalks, stairs, driveways, curbs and gutters, stairs, dams, bridges and tunnels. They also texture, chip, grind and cure finished concrete work and are responsible for the repair and restoration of damaged concrete. They apply various finishes to concrete surfaces such as architectural, exposed, acid-stained, patterned, stamped, broomed overlays and smooth finishes. They install expansion joints and edge the concrete surfaces and install fixtures such as anchor bolts, steel plates and door sills. They also apply membranes and other waterproofing products to concrete. Concrete finishers must possess a sound knowledge of the properties of various types of concrete and how mixes, proportions and additives affect concrete strength, setting and curing times, finish and durability. Materials that concrete finishers work with include concrete, grouts, site-cured plastics, exotics, epoxies, polyurethanes and acrylic.

Much of concrete finishing has become mechanized with power screeds, power trowels, mechanical vibrators and pumps. Hand trowelling is still required for small jobs and to finish hard-to-reach spots in corners, edges and around obstacles such as pipes.

Concrete finishers work in the construction sector in both indoor and outdoor conditions. Outdoor work is weather-dependant and there may be less work available in the winter. Conversely, overtime is often required when the weather demands it.

Specialization in this trade is common. Concrete finishers may specialize in working with specific materials such as colored concrete, exposed aggregates and various epoxies, or specific techniques such as power trowelling and finishing curbs and gutters.

Key attributes for people entering this trade are stamina, spatial perception and hand-eye coordination. Artistic skills are also helpful in this trade. Some physical activities of this trade are heavy lifting, climbing, balancing, stooping, kneeling, crouching, crawling and reaching. There is some risk of injury from working on uneven footing and from other construction site hazards.

Concrete finishers work with a variety of other tradespeople. Heavy equipment operators may prepare the sub-base for concrete, ironworkers may prepare and place the reinforcing material and carpenters may place the formwork. It is the concrete finishers' responsibility to inspect this work and ensure that it is suitable for receiving the concrete. They also interact with plumbers and electricians when pipes and wires are embedded in the concrete.

With experience, concrete finishers may move into supervisory, management or instructing roles.

OCCUPATIONAL OBSERVATIONS

There is a trend toward specialty concretes, including high performance concrete that has a leaner mix with a lower percentage of fines and cement, resulting in lower costs but a smaller finishing window.

The increased use of polymers in concrete coatings requires a greater emphasis on safety and the use of personal protective equipment.

In the area of vertical repairs, there is increasing use of premixed, high performance grouts.

There is a growing use of self-levelling underlayments for floor levelling.

The introduction of rust inhibitors as a concrete admixture reduces the need for epoxy-coated rebar.

The use of superplasticizers, slags, flyash, and poly and steel fibres in slabs-on-grade reduces cracking and movement. Concrete finishers may be required to add these materials to the mix on-site and the texture of those materials can cause some difficulties during the placement and finishing processes.

Concrete finishers have access to an increasing variety of machines. Some machines spread materials, resulting in more accurate distribution. Laser-guided, mechanically operated screeds increase flatness and levelness of slabs. Edge machines used to finish edges are reducing the amount of overall handwork necessary. Technological advances in riding equipment have resulted in less physical strain to the concrete finisher and have increased the quality of finish. All machines have increased productivity.

SAFETY

Safe working procedures and conditions, accident prevention and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers and employees. It is imperative that all parties are aware of circumstances and conditions that may lead to injury or harm. Safe learning experiences and environments can be created by controlling the variables and behaviours that may contribute to accidents or injury.

It is generally recognized that a safety-conscious attitude and work practices contribute to a healthy, safe and accident-free working environment.

It is imperative to apply and be familiar with the Occupational Health and Safety Acts and Workplace Hazardous Materials Information System (WHMIS) Regulations. As well, it is essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

As safety education is an integral part of training in all jurisdictions, personal safety practices are not recorded in this document. However, the technical safety aspect relating to each task and sub-task are included throughout this analysis.

ANALYSIS

BLOCK A

OCCUPATIONAL SKILLS

Trends: *More sophisticated measuring equipment such as laser levels are being used. New tools such as power screeds have made many tasks easier. Cementitious materials and admixtures are constantly being developed and have revolutionized the industry.*

Related Components: Cementitious materials, concreting materials, admixtures, bonding materials, base materials, priming material, reinforcing material, MSDS, blueprints and drawings, specifications.

Tools and Equipment: See Appendix A.

Task 1 **Uses tools and equipment.**

Context: *Proper use of tools is very important to perform the tasks in the concrete industry effectively and safely.*

Sub-task

1.01 **Uses hand tools.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

Supporting Knowledge & Abilities

1.01.01	knowledge of types of hand tools and their applications
1.01.02	ability to select hand tools
1.01.03	ability to clean hand tools
1.01.04	ability to maintain hand tools
1.01.05	ability to recognize worn, damaged and unsafe hand tools

Sub-task

1.02 Uses power tools.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

1.02.01	knowledge of types of electric tools and their applications
1.02.02	knowledge of types of air tools and their applications
1.02.03	knowledge of types of hydraulic tools and their applications
1.02.04	knowledge of types of gas-powered tools and their applications
1.02.05	knowledge of types of powder-actuated tools and their applications
1.02.06	ability to select power tools
1.02.07	ability to clean power tools
1.02.08	ability to perform power tool maintenance such as checking oil and gas
1.02.09	ability to recognize worn, damaged and unsafe power tools

Sub-task

1.03 Uses measuring equipment.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

1.03.01	knowledge of types of measuring equipment such as laser level, measuring tape and builder's level
1.03.02	knowledge of imperial and metric measurements
1.03.03	ability to select measuring equipment

1.03.04	ability to clean measuring equipment
1.03.05	ability to maintain measuring equipment
1.03.06	ability to recognize worn, damaged and unsafe measuring equipment

Sub-task

1.04 Uses personal protective equipment (PPE).

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

1.04.01	knowledge of types of PPE such as breathing apparatus, eye and ear protection, hard hat, safety vest, fall arrest equipment and skin protection
1.04.02	knowledge of hazards such as silica dust and falling objects
1.04.03	knowledge of potential effects of exposure to concrete materials such as silicosis and dermatitis
1.04.04	knowledge of training requirements for certain PPE such as fall arrest equipment and respirators
1.04.05	ability to select PPE
1.04.06	ability to maintain PPE
1.04.07	ability to recognize worn, damaged and unsafe PPE

Task 2 Organizes work.

Context: These organizational skills are important for concrete finishers to perform their tasks as well as advance in their careers. Weather conditions and timing impact the placing, setting and curing of concrete.

Sub-task

2.01 Interprets documentation.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

2.01.01	knowledge of blueprints and drawings
2.01.02	knowledge of safety documentation such as material safety data sheet (MSDS) and Workplace Hazardous Materials Information System (WHMIS) symbols
2.01.03	ability to interpret specifications
2.01.04	ability to interpret product instructions and manufacturers' recommendations
2.01.05	ability to follow work orders
2.01.06	ability to interpret standards documentation such as CSA and ACI

Sub-task

2.02 Determines material requirements and quantities.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

2.02.01	knowledge of concrete materials such as cement, aggregates, exotics, admixtures and grout
2.02.02	knowledge of base materials such as gravel and recycled crushed concrete
2.02.03	knowledge of reinforcement materials such as rebar, welded wire mesh and fibres

2.02.04	knowledge of membranes such as polyethylene and insulating membranes
2.02.05	knowledge of formwork material and systems such as dimensional lumber and steel forms
2.02.06	ability to perform calculations such as volume, area and perimeter

Sub-task

2.03 Communicates with others. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

2.03.01	knowledge of trade terminology
2.03.02	knowledge of hand signals
2.03.03	ability to communicate with co-workers and supervisors
2.03.04	ability to communicate with suppliers and manufacturers
2.03.05	ability to communicate with related tradespeople such as plumbers, crane operators, carpenters, electricians and ironworkers
2.03.06	ability to use communication equipment such as cell phones, two-way radios and computers
2.03.07	ability to explain processes to laypersons
2.03.08	ability to mentor apprentices

Sub-task

2.04 Schedules work procedures.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	no	NV	NV	NV	yes	yes	yes	ND	ND	ND

2.04.01	knowledge of environmental conditions and their effects on concrete
2.04.02	knowledge of sequence of operations
2.04.03	knowledge of timing of procedures
2.04.04	ability to monitor weather conditions
2.04.05	ability to adapt to changing environmental conditions
2.04.06	ability to schedule work with other trades

Sub-task

2.05 Maintains safe work environment.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

2.05.01	knowledge of federal and provincial/territorial workplace rules and regulations
2.05.02	knowledge of due diligence, employers' and employees' responsibilities, and safety procedures
2.05.03	knowledge of company safety policies and procedures
2.05.04	knowledge of worksite practices around issues such as confined space entry and asbestos removal
2.05.05	knowledge of worksite first aid policies

2.05.06	knowledge of location of safety equipment such as fire extinguisher, first aid kit and eye wash station
2.05.07	knowledge of WHMIS
2.05.08	knowledge of potential hazards
2.05.09	knowledge of safe storage and disposal of dangerous goods
2.05.10	ability to keep worksite clean

Task 3 Prepares site.

Context: Site conditions are extremely important to concrete finishers. They impact the timing and sequencing of many of the procedures involved in the concrete finishers' work.

Sub-task

3.01 Inspects site.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

3.01.01	knowledge of optimum site conditions
3.01.02	knowledge of site problems such as poor drainage, obstructions and utilities
3.01.03	ability to determine site conditions such as access, ventilation and exposure
3.01.04	ability to assess on-site services such as water and electricity requirements
3.01.05	ability to check elevation as specified
3.01.06	ability to check rebar placement as specified
3.01.07	ability to check uniformity of sub-base grade as specified

Sub-task

3.02 Prepares sub-grade.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

3.02.01	knowledge of base materials such as gravel, clay and recycled crushed concrete
3.02.02	knowledge of sub-grade compaction requirements
3.02.03	ability to place base materials to sub-grade level
3.02.04	ability to compact base with equipment such as compaction rollers and plate tampers
3.02.05	ability to install moisture and insulation barriers, filter fabric and void forms

Task 4 Uses formwork.

Context: Formwork holds and moulds concrete or grout in place while the surface is being worked. Formwork is generally removed or stripped once the concrete or grout is set. Construction, expansion and isolation joints are installed with formwork but are a permanent fixture of the concrete. These joints are often filled with self-levelling caulking or other compounds.

Sub-task

4.01 Constructs concrete formwork.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	no	NV	NV	NV	yes	yes	yes	ND	ND	ND

4.01.01	knowledge of formwork for structures such as slabs-on-grade, curbs and gutters, and stairs
4.01.02	knowledge of forming systems such as snap ties, cam lock and tie rods
4.01.03	knowledge of mathematical calculations such as rise and run and 3-4-5 calculations

4.01.04	ability to perform layout such as squaring and setting grades
4.01.05	ability to install bracing and shoring to secure formwork
4.01.06	ability to install formwork for grout
4.01.07	ability to apply form release agents
4.01.08	ability to apply retarders and form liners to achieve architectural finish

Sub-task

4.02 Inspects formwork.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

4.02.01	knowledge of construction formwork
4.02.02	knowledge of cambers, deflection and shrinkage
4.02.03	ability to identify defects in formwork
4.02.04	ability to inspect bracing, shoring and supports
4.02.05	ability to check formwork finish grade according to specifications

Sub-task

4.03 Installs construction, isolation and expansion joints.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

4.03.01	knowledge of concrete volume changes
4.03.02	knowledge of joint placement
4.03.03	knowledge of types of joints

4.03.04	knowledge of joint components such as dowels, keyways and expansion materials
4.03.05	ability to maintain finished elevation

Sub-task

4.04 Strips forms. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

4.04.01	knowledge of form and bracing removal practices
4.04.02	knowledge of form removal requirements such as proper strip timing
4.04.03	ability to recognize cured concrete
4.04.04	ability to clean and repair forms for re-use
4.04.05	ability to remove nails and foreign objects from forms

BLOCK B

CONCRETE PLACEMENT

Trends: *The use of bigger concrete pumps with longer reach allows concrete finishers to pour larger volumes of concrete in a shorter period of time. There is an increased use of vibrating screeds which save on labour and time.*

Related Components: Concrete, reinforcing material, formwork, admixture, bonding agents, evaporation retarders, debonding agents.

Tools and Equipment: PPE, measuring equipment, square nose shovel, bull float, concrete rakes, straightedge, trowel, wheelbarrow, magnesium float, lifting hook, darby, power screeds, vibrators, power buggy, lights.

Task 5 **Places concrete.**

Context: *Concrete finishers may transport concrete from the truck to the desired point of discharge. They rough grade and consolidate concrete to remove air pockets and to prevent architectural and potential structural defects prior to establishing elevation. They may place concrete for slabs, sidewalks, stairs, walls and other structures.*

Sub-task

5.01 **Transports concrete.**

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

5.01.01 knowledge of transportation methods such as pumping, conveyors, power buggy and crane bucket

5.01.02 knowledge of time restriction of load of concrete

5.01.03 ability to verify that concrete type matches specifications

5.01.04 ability to operate discharge hose

5.01.05 ability to operate power buggy

5.01.06 ability to operate crane bucket discharge handle

Sub-task

5.02 Spreads concrete.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

5.02.01	knowledge of starting point of concrete placement
5.02.02	knowledge of desired width of screed
5.02.03	knowledge of types of embedded reinforcement such as fibre mesh and steel pins
5.02.04	knowledge of effects of embedded reinforcement on handling of concrete
5.02.05	ability to identify related mechanical installations such as floor drain, clean-out and electrical boxes
5.02.06	ability to maintain location of rebar and welded wire mesh
5.02.07	ability to spread evenly at rough grade using tools such as concrete rakes and square nose shovel
5.02.08	ability to confirm required slump and consistency

Sub-task

5.03 Consolidates concrete.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

5.03.01	knowledge of consolidation techniques such as internal vibration and external vibration
5.03.02	knowledge of sizes of vibrators
5.03.03	knowledge of the effect of vibration on forms

5.03.04	ability to determine field of vibration to ensure consolidation
5.03.05	ability to determine when to stop the vibration to prevent defects such as segregation and honeycombs

Task 6 Levels concrete.

Context: Concrete finishers level concrete to established elevation using wet screeds, screeds, bull floats and related tools to achieve required tolerances.

Sub-task

6.01 Establishes elevation.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	no	NV	NV	NV	yes	yes	yes	ND	ND	ND

6.01.01	knowledge of techniques for establishing elevation such as operating laser level, builder's level and hand level
6.01.02	knowledge of slopes necessary for drainage
6.01.03	ability to identify benchmarks
6.01.04	ability to transfer benchmark elevation to work area
6.01.05	ability to perform calculations such as percentage of slope
6.01.06	ability to place wet screeds and edge screeds

Sub-task

6.02 Screeds concrete.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

6.02.01 knowledge of manual and mechanical screeds such as dimensional lumber, power screeds and laser screeds

6.02.02 ability to select screeding methods according to size of pour and properties of concrete

6.02.03 ability to screed to finished grade using wet screeds, edge screeds and screed rods

Sub-task

6.03 Bull floats concrete.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

6.03.01 knowledge of when to begin bull floating (after screeding and before bleed water appears)

6.03.02 knowledge of direction of bull floating

6.03.03 ability to establish pitch and length of handle

6.03.04 ability to select bull floats according to type and slump of concrete

Sub-task

6.04 Achieves tolerances.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

6.04.01 knowledge of tolerance levels for particular project

6.04.02	knowledge of required consistency of concrete
6.04.03	ability to interpret floor levelness (F_L) and floor flatness (F_F)
6.04.04	ability to achieve F_L and F_F
6.04.05	ability to select and use specialized levelling and measuring tools
6.04.06	ability to operate highway straightedge
6.04.07	ability to select and operate mechanical finish equipment such as single, double, triple power trowels

BLOCK C

CONCRETE FINISHING

Trends: *The increased complexity of finishing equipment including riding power trowels, edge machines and hardener spreaders is increasing concrete finishers' productivity. Higher performance concretes require a more precise timing of the finishing process.*

Related Components: Concrete, hardeners (metallic and natural aggregate), colouring products, debonding agents, retarders, accelerators, curing agents, evaporation retarders, decorative aggregate.

Tools and Equipment: PPE, hand tools, mechanical spreader, power disk machine, power edger, specialized concrete saw, power trowel, power washer, vented heater, lights.

Task 7 **Floats concrete.**

Context: *Concrete finishers float the surface bringing up moisture and fine aggregate and embedding large aggregates. At this stage, irregularities are removed and broadcast materials are embedded. This is the important first step in the finishing process. Timing is critical.*

Sub-task

7.01 **Floats concrete by hand.** **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

7.01.01	knowledge of effect of environmental conditions on the concrete
7.01.02	knowledge of the effect of admixtures in the concrete
7.01.03	knowledge of effect of improper application and finishing of broadcast products
7.01.04	ability to assess surface conditions such as firmness and presence of bleed water

7.01.05	ability to apply various floating techniques such as pressure application, angle of float and pattern of floating
7.01.06	ability to apply surface evaporation retarders to ensure workability

Sub-task

7.02 Floats concrete by machine. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

7.02.01	knowledge of types of machines such as walk-behind, pan and edge
7.02.02	knowledge of types of blades such as float and combination
7.02.03	knowledge of effect of blade speed and pitch on concrete surfaces
7.02.04	ability to assess surface conditions such as firmness and presence of bleed water
7.02.05	ability to apply various techniques such as working on joints, levelling bumps and applying criss-cross patterns
7.02.06	ability to identify defects in blades and machine

Task 8 **Hand-tools concrete.**

Context: *Concrete finishers hand-tool plastic concrete to control cracking during the curing process, to protect edges, to provide decorative borders and to aid in the removal of formwork. Extruded surfaces are hand-tooled to complete the contoured finish.*

Sub-task

8.01 **Tools control joints.** **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

8.01.01 knowledge of depth and spacing requirements

8.01.02 ability to assess surface conditions such as firmness and presence of bleed water

8.01.03 ability to calculate depth and spacing of control joints

8.01.04 ability to ensure joint straightness using lines and straightedges

8.01.05 ability to apply tooling techniques such as pressure application and angle of tool

Sub-task

8.02 **Edges perimeter of slab.** **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

8.02.01 knowledge of types of edgers such as adjustable and tread

8.02.02 knowledge of edger composition such as steel, magnesium and bronze

8.02.03 knowledge of radii required for specific applications

8.02.04 ability to assess surface conditions such as firmness and presence of bleed water

8.02.05 ability to clean adjacent surfaces

8.02.06	ability to apply edging techniques to ensure a smooth and level surface
8.02.07	ability to repair stone pops and surface tears

Sub-task

8.03 Finishes extruded concrete surfaces.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

8.03.01	knowledge of types of extruded surfaces such as curb and gutter, sidewalk and core-floor
8.03.02	knowledge of extruded concrete characteristics such as slump, air content and mix design
8.03.03	ability to use specialized tools such as mules, long handled curb edgers, jointers and fresno trowels
8.03.04	ability to apply finishing techniques to maintain the contour of the surface

Task 9 Trowels concrete.

Context: Concrete finishers trowel concrete to increase the density of the surface and to achieve the final finish. Incorrect timing of the process could result in surface defects.

Sub-task

9.01 Trowels concrete by machine.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

9.01.01	knowledge of the effects of environmental conditions on the concrete
9.01.02	knowledge of the effects of admixtures in the concrete

9.01.03	knowledge of types of machines such as walk-behind, rider and edger machines
9.01.04	knowledge of the effect of blades such as pans, floats, trowel and combination
9.01.05	knowledge of the required surface texture
9.01.06	knowledge of the effects of poor ventilation on slab surface
9.01.07	knowledge of the effects of improper application and finishing of broadcast materials
9.01.08	ability to assess surface conditions such as firmness and appearance
9.01.09	ability to apply various trowelling techniques such as working on joints and applying criss-cross patterns
9.01.10	ability to identify defects in trowel blades
9.01.11	ability to clean trowel throughout process
9.01.12	ability to use emergency shut-off procedures
9.01.13	ability to determine when trowelling process is complete

Sub-task

9.02 Trowels concrete by hand.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

9.02.01	knowledge of the effects of environmental conditions on the concrete
9.02.02	knowledge of the effects of admixtures in the concrete
9.02.03	knowledge of required surface texture
9.02.04	knowledge of the effects of trowel angles and pressures

	9.02.05	ability to assess surface conditions such as firmness and appearance
	9.02.06	ability to correct surface imperfections such as pin holes, stone pops and surface tears
	9.02.07	ability to determine when the trowelling process is complete

Task 10 Applies surface treatments to plastic concrete.

Context: Concrete finishers apply surface treatments to plastic concrete to achieve specified surface qualities. It is critical that surface treatments be done at the right time.

Sub-task

10.01 Broadcasts products on concrete surface.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

10.01.01	knowledge of types of broadcast products such as hardeners, colours and powdered release agents
10.01.02	knowledge of types of broadcast hardeners such as natural aggregates and metallics
10.01.03	knowledge of the effect of uneven distribution
10.01.04	ability to assess surface conditions such as firmness and the presence of bleed water
10.01.05	ability to apply techniques such as broadcasting by hand and machine
10.01.06	ability to broadcast product evenly and in specified quantity
10.01.07	ability to work product into the concrete surface

Sub-task

10.02 Applies surface retarder. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

10.02.01 knowledge of types of surface retarders such as water-based and glycol-based

10.02.02 knowledge of surface retarder applications such as delaying the finishing process and producing exposed aggregate surfaces

10.02.03 ability to assess surface conditions such as firmness and dryness

10.02.04 ability to determine amount of retarder required

10.02.05 ability to operate spray equipment to ensure even distribution

10.02.06 ability to determine when surface retarder is required

Sub-task

10.03 Textures concrete surface. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

10.03.01 knowledge of types of textured surfaces such as broomed, tyne, burlap, swirl (float or trowel) and herringbone

10.03.02 knowledge of texturing requirements for traction and drainage

10.03.03 ability to assess surface conditions such as firmness and dryness

	10.03.04	ability to operate tools and equipment to produce desired patterns
	10.03.05	ability to apply texturing techniques to achieve patterns

Sub-task

10.04 Top seeds concrete surface. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

10.04.01	knowledge of the elevation of screeded surface prior to top seeding
10.04.02	knowledge of saturated surface-dry (SSD) requirement for rock
10.04.03	ability to assess surface conditions such as firmness and dryness
10.04.04	ability to place rock randomly or in desired pattern
10.04.05	ability to completely embed rock using tools such as a darby or magnesium float

Sub-task

10.05 Stamps concrete surface. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

10.05.01	knowledge of types of patterns such as cobblestone, random stone and barn board
10.05.02	knowledge of stamp composition such as rubber and metal
10.05.03	knowledge of mix design required to accommodate desired pattern

10.05.04	knowledge of effects of broadcast products on setting time prior to stamping
10.05.05	knowledge of effects of weather conditions on stamping procedures
10.05.06	ability to assess surface conditions such as firmness and dryness
10.05.07	ability to apply release agents such as powder or liquid
10.05.08	ability to lay out pattern
10.05.09	ability to stamp pattern consistently for location and depth
10.05.10	ability to protect surrounding area from broadcast products

BLOCK D

CONCRETE CURING AND PROTECTION

Trends: *New products for concrete curing and protection are always coming onto the market.*

Related Components: Concrete, water, chemical curing compounds, sealers, polyethylene, burlap, barricades.

Tools and Equipment: PPE, calculator, tape measure, thermometer, chalk line, brooms, brushes, hammer, hand saw, caulking gun, sprayer, hoses, bucket, lights, power sprayer, power saw and blades, electric cutter.

Task 11 Cures concrete.

Context: *Concrete finishers cure concrete to improve its strength and increase its durability. Correct temperature is important to the curing process.*

Sub-task

11.01 Wet-cures concrete.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

11.01.01	knowledge of timing for curing
11.01.02	knowledge of requirements for proper hydration
11.01.03	ability to pond concrete
11.01.04	ability to use sprinklers and soaker hose
11.01.05	ability to use wet burlap method

Sub-task

11.02 Chemical cures concrete.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

11.02.01	knowledge of types of curing compounds such as clear membrane, fugitive dye and dissipating curing compound
11.02.02	knowledge of timing for application of compound
11.02.03	knowledge of effects of curing compounds on curing process
11.02.04	knowledge of risks associated with application
11.02.05	ability to apply compound to ensure uniform coverage

Task 12 Protects concrete.

Context: Concrete should be protected from wind, hot sun, rain and cold during the curing process. Improper curing results in poor quality, lower strength concrete. Extreme temperatures during the curing process may cause surface and structural damage. Cutting control joints is important for concrete protection to minimize random cracking.

Sub-task

12.01 Maintains desired temperature.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

12.01.01	knowledge of effects of ground and air temperature on concrete
12.01.02	knowledge of effects of retarding admixtures to slow set time
12.01.03	knowledge of temperature ranges for curing processes

12.01.04	ability to use non-chloride and chloride accelerators to speed set time
12.01.05	ability to insulate work area to keep concrete from freezing using materials such as straw and polyethylene, and insulated tarps
12.01.06	ability to set up hoarding and heaters

Sub-task

12.02 Places physical protection. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

12.02.01	knowledge of conditions requiring the use of protection
12.02.02	knowledge of types of sealers such as acrylic and epoxy
12.02.03	ability to restrict public access using barricades such as caution tape, ribbon, safety fence, pylons and wooden barricades
12.02.04	ability to apply sealer evenly
12.02.05	ability to place polyethylene to protect concrete from rain

Sub-task

12.03 Saw cuts control joints. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

12.03.01	knowledge of timing for saw cutting of control joints
12.03.02	knowledge of location, spacing and depth of control joints
12.03.03	ability to lay out cutting pattern

12.03.04	ability to select equipment for wet or dry cutting
12.03.05	ability to clean and fill joints with materials such as polyurethane caulking and backing rod
12.03.06	ability to mix caulking compounds such as self-levelling and non-sag

BLOCK E

CONCRETE MODIFICATION, REPAIR AND GROUTING

Trends: *New decorative products such as acid stain, seamless coatings, polyurethane coating and decorative spray-on coatings are being introduced to the market. These new products allow concrete finishers to modify the finished surface of concrete without having to remove the entire depth. Seamless coatings are being used to create a more sanitary surface.*

Related Components: Concrete, grouts, epoxies, polyurethane, acid, degreasing agents, bonding agents, specialized cleaners.

Tools and Equipment: PPE, measuring equipment, hand tools, power tools, lights.

Task 13 Repairs concrete.

Context: *Concrete finishers must access area to be repaired, decide on repair method, prepare surface to be repaired and carry out installation of repair product in a safe, cost-effective and timely manner.*

Sub-task

13.01 Inspects to determine defects. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

13.01.01	knowledge of types of defects such as scaling, spalling, crazing and honeycombs
13.01.02	ability to visually and audibly inspect the concrete
13.01.03	ability to determine cause of defect such as stress, efflorescence and improper placing or finishing
13.01.04	ability to access affected area
13.01.05	ability to determine if destructive testing is required

Sub-task

13.02 Removes materials.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

13.02.01	knowledge of types of removal equipment such as grinder, chipping hammer, scarifier, scabbler and sandblaster
13.02.02	knowledge of length of time required to remove materials
13.02.03	knowledge of disposal methods
13.02.04	ability to determine the removal procedure
13.02.05	ability to operate removal equipment
13.02.06	ability to protect and isolate area of removal with barricades
13.02.07	ability to determine area and depth of material to be removed
13.02.08	ability to determine if electrical and mechanical hazards are embedded in area to be repaired

Sub-task

13.03 Selects materials and process of repair.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	no	NV	NV	NV	yes	yes	yes	ND	ND	ND

13.03.01	knowledge of repair materials such as grouts, epoxies and mortar
13.03.02	knowledge of types of repair processes such as drypack, hand patch and pour back
13.03.03	knowledge of hazards such as vapours and contaminants

13.03.04	knowledge of mixing procedures
13.03.05	ability to select repair material and process based on cost, down-time, structural/architectural requirements and location of repair
13.03.06	ability to assess repair area conditions such as moisture content, temperature and visible contaminants
13.03.07	ability to match curing procedures with project requirements
13.03.08	ability to determine if aggregate fillers are required with repair materials

Sub-task

13.04 Prepares surface for repair. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

13.04.01	knowledge of repair method
13.04.02	knowledge of bonding agents such as latex modified, slurry mix and epoxy
13.04.03	ability to pre-soak surfaces to SSD state using methods such as wet burlap and spraying
13.04.04	ability to operate surface preparation equipment such as grinder, scabbler and sand blaster
13.04.05	ability to select specific profile of surface to receive repair
13.04.06	ability to apply bonding agents

13.05 Parges vertical surfaces.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	no	yes	yes	ND	ND	ND

13.05.01	knowledge of types of parging materials
13.05.02	knowledge of surface defects
13.05.03	knowledge of mixing methods for parging
13.05.04	knowledge of colouring techniques
13.05.05	ability to follow manufacturers' specifications
13.05.06	ability to apply finishing methods
13.05.07	ability to apply texturing methods such as sponging, grinding and dry sacking

Task 14 Cuts and cores cured concrete.

Context: *Concrete finishers must be able to identify potential hazards within the work area affecting personal and public safety. They must also determine depth of cut or core and choose cutting or coring equipment to complete the task on cured concrete.*

Sub-task

14.01 Identifies hazards.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

14.01.01	knowledge of potential embedded hazards such as post-tensioning and electrical cables
14.01.02	knowledge of potential hazards of gas-powered equipment such as carbon monoxide contamination
14.01.03	ability to interpret as-built or working drawings

14.01.04	ability to install shoring devices such as steel beam, scaffolding and anchoring
14.01.05	ability to erect perimeter safety barriers around and underneath work area

Sub-task

14.02 Measures depth of cut.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

14.02.01	knowledge of non-destructive and destructive measuring devices such as tape measure and carbide drill bit
14.02.02	ability to interpret as-built or working drawings

Sub-task

14.03 Selects cutting and coring equipment.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

14.03.01	knowledge of types of cutting and coring equipment such as floor saw, core drill and cutoff saw
14.03.02	knowledge of types of saw blades and core drill bits
14.03.03	knowledge of wet and dry blades
14.03.04	ability to select cutting and coring equipment according to depth of cut
14.03.05	ability to select saw blade according to depth of cut

14.03.06	ability to select core drill bit according to depth and diameter of cut
14.03.07	ability to set up and mount core drill equipment

Task 15 Applies surface treatments to hardened concrete.

Context: Concrete finishers must clean and prepare existing concrete surfaces using abrading or washing equipment to ensure that seamless coatings, bonded toppings or acid stain can be applied. They must also be able to use abrading tools and equipment on hardened concrete to achieve an architectural finish such as sand blasted and bush hammered.

Sub-task

15.01 Prepares surface.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

Supporting Knowledge & Abilities

15.01.01	knowledge of types of abrading equipment such as sand/shot blaster and power grinders
15.01.02	knowledge of surface cleaning equipment such as pressure washers, steam cleaner and wet/dry vacuum
15.01.03	knowledge of surface cleaning procedures such as acid washing and pressure washing
15.01.04	knowledge of degreasing agents such as caustic soda and citrus-based cleaners
15.01.05	ability to operate abrading equipment
15.01.06	ability to work with concentrated acid cleaners
15.01.07	ability to determine structural soundness
15.01.08	ability to install zinc strips for seamless floors
15.01.09	ability to follow manufacturers' recommendations for cleaning products

Sub-task

15.02 Abrades surface to achieve architectural finish.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

15.02.01 knowledge of types of abrading equipment such as sand blaster, grinder and bush hammer

15.02.02 knowledge of types of architectural finishes such as textured and polished

15.02.03 knowledge of environmental impact of abrading

15.02.04 ability to achieve required architectural finishes using methods such as sand blasting, bush hammering and grinding

15.02.05 ability to operate abrading equipment such as sand blaster, grinder and bush hammer

15.02.06 ability to determine depth of abrasion

15.02.07 ability to contain material dispelled during abrading process

Sub-task

15.03 Applies seamless coatings.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

15.03.01 knowledge of types of coatings such as epoxy and non-static floor coating

15.03.02 knowledge of moisture content of substrate

15.03.03 knowledge of toxicity of coating material

15.03.04 knowledge of mixing techniques

15.03.05 ability to follow manufacturers' recommendations

15.03.06	ability to use epoxy tools such as trowels, spiked roller and squeegee
15.03.07	ability to broadcast aggregates
15.03.08	ability to dispose of toxic waste material

Sub-task

15.04 Applies bonded and non-bonded toppings to concrete.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

15.04.01	knowledge of types of toppings such as grout, pre-mixed topping and concrete
15.04.02	knowledge of topping reinforcement such as polyethylene fibre, rebar and welded wire mesh
15.04.03	knowledge of curing methods for toppings
15.04.04	ability to determine if topping needs to be bonded or non-bonded
15.04.05	ability to confirm that existing surface is ready to receive bonding agent
15.04.06	ability to follow manufacturers' specifications

Sub-task

15.05 Applies acid stain.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

15.05.01	knowledge of surface preparation such as removing existing sealers, dirt, oil and chemicals
15.05.02	knowledge of acid application time
15.05.03	knowledge of drying time

15.05.04	knowledge of types of protective sealers such as epoxy sealer and polyurethane sealer
15.05.05	ability to follow manufacturers' specifications
15.05.06	ability to remove acid residue prior to applying top coats
15.05.07	ability to perform litmus test
15.05.08	ability to apply protective sealer to acid stained surfaces

Task 16 Grouts.

Context: Concrete finishers install grouts to transfer loads to concrete foundations and to fill voids between concrete elements.

Sub-task

16.01 Selects installation procedure. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

16.01.01	knowledge of types of procedures such as drypack, pouring and injecting
16.01.02	knowledge of types of grout such as non-shrink, expandable and epoxy
16.01.03	ability to determine procedure suitable to the task such as grouting machine bases, pre-cast joints and cracks

Sub-task

16.02 Prepares surface for grouting. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

16.02.01	knowledge of surface preparation requirements for specific grout

16.02.02	knowledge of surface preparation techniques
16.02.03	ability to clean surfaces
16.02.04	ability to apply bonding agents
16.02.05	ability to pre-soak surfaces to SSD state using methods such as wet burlap and spraying

Sub-task

16.03 Mixes grout. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

16.03.01	knowledge of mixing techniques such as drill and whip, paddle mixer, and shovel and wheelbarrow
16.03.02	knowledge of ratios
16.03.03	knowledge of mixing hazards such as solvent fumes, grout dust and acids
16.03.04	knowledge of pot life
16.03.05	ability to follow manufacturers' specifications such as temperature and quantities
16.03.06	ability to measure weights and volumes
16.03.07	ability to clean mixing area and tools to avoid contamination
16.03.08	ability to prepare test batch to check for consistency, colour and flow

Sub-task

16.04 Installs grout. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

16.04.01	knowledge of properties of grout

	16.04.02	knowledge of installation methods such as injecting, pouring, strapping, rodding and vibrating
	16.04.03	knowledge of pot life
	16.04.04	ability to operate installation equipment such as vibrators and injection guns
	16.04.05	ability to compact drypack grout

Sub-task

16.05 Finishes exposed grout surfaces.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	yes	NV	NV	NV	yes	yes	yes	ND	ND	ND

	16.05.01	knowledge of required finish and contour
	16.05.02	ability to tool surfaces into required shape

APPENDICES

TOOLS AND EQUIPMENT

Personal Protective Equipment

barrier creams
breathing apparatus (dust mask respirators)
disposable coveralls
face shield
fall arrest equipment
first aid kit
fluorescent vest
gloves
hard hats
hearing protection
knee boards and pads
rain suit
rubber boots
safety boots
safety glasses
safety goggles

Measuring Equipment

air meter
builder's level
calculator
chalk line
flow cone
hand level
laser level
slump cone
square
straightedge
string line
tape measure
thermometer
torpedo level
transit

Hand Tools

backing rod installation tool
broom
buckets
bull float
caulking gun
chipping hammer
claw hammer
cold chisels
concrete rake
cove base tool
crowbar
darby
edger
epoxy injection gun
file
fresno trowel
hand brushes
hand saw
hand stone (grinder)
hand trowels
handled border edger
highway straightedge
jitter bug tamper
jointer
lifting hook
magnesium float
margin trowel
mule (dozer)
pointer trowel
pry bar
rakes
roller bug
round nosed shovel
rubbing stone

Hand Tools (continued)

scraper
sledge hammer
socket set
spiked roller
sponge/rubber float
sprayers
square nose shovel
squeegee
stamp rollers
stamping tool
stamps
two pound hammer
tyning tool
utility knife
water brush
water hose
wheelbarrow
wood bull float
wood float

Power Tools

chipping gun and bits
compaction rollers
compressor
conveyors
core drill and bits
cut-off saw
electric cutter
extension cords
generator
laser screed
lights
mechanical spreader
plaster mixer
power buggy
power bush hammer
power disk machine
power drill/mixer
power edger
power grinder
power planer
power saw and blades
power screed
power sprayers
power trowel
power washer
pressure pump
sand/shot blaster
scabbler
scarifier
shot blaster
specialized concrete saw
steam cleaner
tamper (compaction)
vented heater
vibrators
wet/dry vacuum

GLOSSARY

admixture	material other than water, aggregates and portland cement that is used as an ingredient of concrete and is added to the mix
aggregate	granular material, such as sand, gravel, crushed stone or recycled concrete aggregates used with cement to produce concrete
bleed water	excess water which rises to the surface of concrete
bull float	a tool comprising a large, flat, rectangular piece of wood or magnesium attached with a rotating pivot to a long handle used to smooth unformed surfaces of freshly placed concrete
burlap	a coarse fabric of jute, hemp, or less commonly flax, for use as a water-retaining cover for curing concrete surfaces
cementitious materials	substances that have cementing properties (set and harden in the presence of water)
concrete	composition of a binding medium and aggregate; commonly consists of a mixture of cement, aggregate and water in varying proportions; mixture is worked into a plastic state and gains hardness through the hydration of water with the cement
consolidate	compaction usually accomplished by vibration of newly placed concrete to minimum practical volume, to mould it within form shapes or around embedded parts and reinforcement, and to reduce void content to a practical minimum
construction joint	the junction of two successive placements of concrete, typically with a keyway or reinforcement across the joint
control joint	a joint cut to control cracking in concrete
crazing	small cracks in a concrete surface caused by uneven contraction during hydration
curing	the maintenance of a satisfactory moisture content and temperature in concrete during its early stages so that desired properties may develop
expansion joint	an isolation joint that allows for expansion and contraction
exposed aggregate	surface texture where cement paste is washed away from concrete slab surface to expose durable aggregates for the riding surface
floating	process of using a tool, usually wood or magnesium, in finishing operations to create a relatively even but still open texture to a fresh concrete surface

form	a temporary structure or mould for the support of concrete while it is setting and gaining sufficient strength to be self-supporting
grout	a mixture of cementitious material and water, with or without aggregate, proportioned to produce a pourable consistency without segregation of the constituents
hardener	a material applied to concrete floors to reduce wearing and dusting
honeycomb	concrete that, due to lack of the proper amount of fines or vibration, contains abundant interconnected large voids or cavities
isolation joint	a pavement joint that prevents bonding of surfaces
overlay	the addition of a new material layer onto an existing pavement surface
plastic	a condition of freshly mixed concrete such that it is readily remoldable, workable and cohesive
retarder	a product that delays the setting of concrete
saturated surface dry (SSD)	condition of an aggregate particle or other porous solid when the permeable voids are filled with water but there is no water on the exposed surface
saw cut	a cut in hardened concrete utilizing diamond or silicone-carbide blades or discs
screeding	the operation of forming a surface by the use of screed guides or a strike off
segregation	separation of various ingredients within a concrete mix
slump	a measure of consistency of freshly mixed concrete
spalling	surface flaking and chipping of concrete
topping	a layer of concrete placed to form a floor surface on a concrete base
wet screed	placing concrete on finish grade across two known points of elevation (called wet screeds)

ACRONYMS

ACI	American Concrete Institute
CSA	Canadian Standards Association
F_F	Floor flatness
F_L	Floor levelness
MSDS	Material Safety Data Sheet
PPE	Personal Protective Equipment
SSD	Saturated surface-dry
WHMIS	Workplace Hazardous Materials Information System

BLOCK AND TASK WEIGHTING

BLOCK A OCCUPATIONAL SKILLS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	18	15	NV	20	NV	NV	NV	10	25	30	ND	ND	ND	20%

Task 1 Uses tools and equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	37	25	NV	50	NV	NV	NV	60	50	65	ND	ND	ND	48%

Task 2 Organizes work.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	25	NV	15	NV	NV	NV	15	10	10	ND	ND	ND	17%

Task 3 Prepares site.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	23	25	NV	18	NV	NV	NV	20	30	15	ND	ND	ND	22%

Task 4 Uses formwork.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	10	25	NV	17	NV	NV	NV	5	10	10	ND	ND	ND	13%

BLOCK B CONCRETE PLACEMENT

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	18	25	NV	15	NV	NV	NV	30	20	20	ND	ND	ND	21%

Task 5 Places concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	50	40	NV	50	NV	NV	NV	40	50	40	ND	ND	ND	45%

Task 6 Levels concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	50	60	NV	50	NV	NV	NV	60	50	60	ND	ND	ND	55%

BLOCK C CONCRETE FINISHING

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	27	30	NV	23	NV	NV	NV	30	35	20	ND	ND	ND	27%

Task 7 Floats concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	35	NV	25	NV	NV	NV	30	10	30	ND	ND	ND	27%

Task 8 Hand-tools concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	15	NV	27	NV	NV	NV	15	30	30	ND	ND	ND	23%

Task 9 Trowels concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	27	20	NV	28	NV	NV	NV	40	40	30	ND	ND	ND	31%

Task 10 Applies surface treatments to plastic concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	18	30	NV	20	NV	NV	NV	15	20	10	ND	ND	ND	19%

BLOCK D CONCRETE CURING AND PROTECTION

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	17	20	NV	17	NV	NV	NV	10	10	15	ND	ND	ND	15%

Task 11 Cures concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	50	50	NV	55	NV	NV	NV	65	60	60	ND	ND	ND	57%

Task 12 Protects concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	50	50	NV	45	NV	NV	NV	35	40	40	ND	ND	ND	43%

BLOCK E CONCRETE MODIFICATION, REPAIR AND GROUTING

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	20	10	NV	25	NV	NV	NV	20	10	15	ND	ND	ND	17%

Task 13 Repairs concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	30	NV	30	NV	NV	NV	40	40	20	ND	ND	ND	32%

Task 14 Cuts and cores cured concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	21	20	NV	15	NV	NV	NV	10	10	15	ND	ND	ND	15%

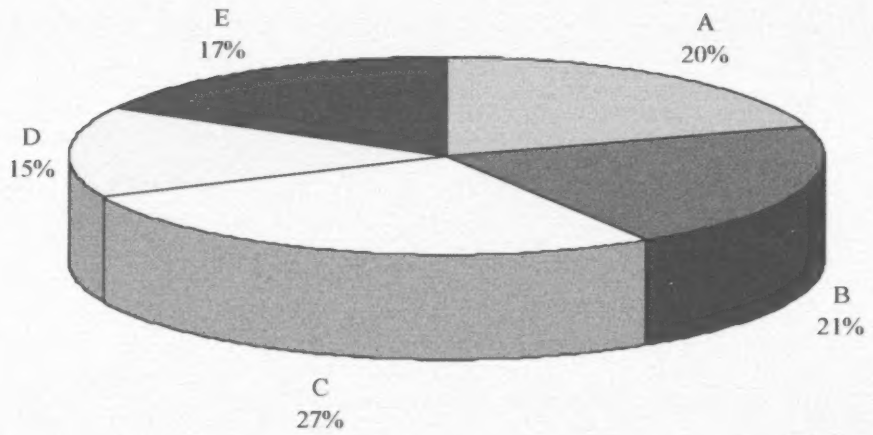
Task 15 Applies surface treatments to hardened concrete.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	22	40	NV	25	NV	NV	NV	15	25	10	ND	ND	ND	23%

Task 16 Grouts.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	27	10	NV	30	NV	NV	NV	35	25	55	ND	ND	ND	30%

PIE CHART*



TITLES OF BLOCKS

Block A	Occupational Skills	Block D	Concrete Curing and Protection
Block B	Concrete Placement	Block E	Concrete Modification, Repair and Grouting
Block C	Concrete Finishing		

* Average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input from workers within the occupation from all areas of Canada. Interprovincial examinations typically have from 100 to 150 multiple-choice questions.

TASK PROFILE CHART – CONCRETE FINISHER (2006)

BLOCKS	TASKS	SUB-TASKS				
A OCCUPATIONAL SKILLS	1. Uses tools and equipment.	1.01 Uses hand tools.	1.02 Uses power tools.	1.03 Uses measuring equipment.	1.04 Uses personal protective equipment (PPE).	
	2. Organizes work.	2.01 Interprets documentation.	2.02 Determines material requirements and quantities.	2.03 Communicates with others.	2.04 Schedules work procedures.	2.05 Maintains safe work environment.
	3. Prepares site.	3.01 Inspects site.	3.02 Prepares sub-grade.			
	4. Uses formwork.	4.01 Constructs concrete formwork.	4.02 Inspects formwork.	4.03 Installs construction, isolation and expansion joints.	4.04 Strips forms.	
B CONCRETE PLACEMENT	5. Places concrete.	5.01 Transports concrete.	5.02 Spreads concrete.	5.03 Consolidates concrete.		
	6. Levels concrete.	6.01 Establishes elevation.	6.02 Screeds concrete.	6.03 Bull floats concrete.	6.04 Achieves tolerances.	
C CONCRETE FINISHING	7. Floats concrete.	7.01 Floats concrete by hand.	7.02 Floats concrete by machine.			
	8. Hand-tools concrete.	8.01 Tools control joints.	8.02 Edges perimeter of slab.	8.03 Finishes extruded concrete surfaces.		

CONCRETE FINISHER (2006)

BLOCKS	TASKS	SUB-TASKS				
	9. Trowels concrete.	9.01 Trowels concrete by machine.	9.02 Trowels concrete by hand.			
	10. Applies surface treatments to plastic concrete.	10.01 Broadcasts products on concrete surface.	10.02 Applies surface retarder.	10.03 Textures concrete surface.	10.04 Top seeds concrete surface.	10.05 Stamps concrete surface.
D **CONCRETE CURING AND PROTECTION**	**11. Cures concrete.**	11.01 Wet-cures concrete.	11.02 Chemical cures concrete.			
	12. Protects concrete.	12.01 Maintains desired temperature.	12.02 Places physical protection.	12.03 Saw cuts control joints.		
E **CONCRETE MODIFICATION, REPAIR AND GROUTING**	**13. Repairs concrete.**	13.01 Inspects to determine defects.	13.02 Removes materials.	13.03 Selects materials and process of repair.	13.04 Prepares surface for repair.	13.05 Parges vertical surfaces.
	14. Cuts and cores cured concrete.	14.01 Identifies hazards.	14.02 Measures depth of cut.	14.03 Selects cutting and coring equipment.		
	15.Applies surface treatments to hardened concrete.	15.01 Prepares surface.	15.02 Abrades surface to achieve architectural finish.	15.03 Applies seamless coatings.	15.04 Applies bonded and non-bonded toppings to concrete.	15.05 Applies acid stain.
	16. Grouts.	16.01 Selects installation procedure.	16.02 Prepares surface for grouting.	16.03 Mixes grout.	16.04 Installs grout.	16.05 Finishes exposed grout surfaces.